FINAL FACT SHEET
NPDES PERMIT REISSUANCE
WASHINGTON AQUEDUCT WATER TREATMENT PLANT
Washington, D.C.
March 14, 2003

NPDES Permit Number: DC0000019

1. NOTICE OF PERMIT ISSUANCE

The United States Environmental Protection Agency, Region III has made a determination to reissue a permit for the discharge of residual treatment solids that result from the drinking water treatment process from the Washington Aqueduct. Permit requirements are based on the Clean Water Act (33 U.S.C. § 1251 et seq.), hereinafter referred to as the Act, and NPDES regulations (40 C.F.R. Parts 122, 124, 125 and 133).

2. PERMITTING AUTHORITY

The NPDES permitting authority is: U.S. Environmental Protection Agency, Region III, Office of Watersheds, MD/DC Branch (3WP13), 1650 Arch Street, Philadelphia, PA 19103.

3. APPLICANT

The applicant is the following: Department of the Army, Washington Aqueduct, U.S. Army Corps of Engineers, Baltimore District, 5900 MacArthur Boulevard, NW, Washington, D.C. 20016-2514.

4. EFFECTIVE DATES

The permit will become effective 30 days after the date EPA issues the permit. The effective and expiration dates and all terms and conditions of this permit are final unless within 30 days of receiving the final permit an interested person(s) file an appeal to the agency's Environmental Appeal Board (EAB), to review any conditions of this permit as provided by 40 C.F.R. § 124.19.

In May of 2000, EPA published a final rule that revises certain regulations pertaining to the NPDES program, including the procedures for appealing EPA determinations on NPDES permits. See Amendments to Streamline the National Pollutant Discharge Elimination System Program Regulations; Round II, 65 Fed. Reg. 30886 (May 15, 2000). Included in the rule are revisions to the permit appeals process that replace evidentiary hearing procedures with direct appeal to the EAB. The rule eliminates the evidentiary hearing process described at 40 C.F.R. Part 124, Subpart E-Evidentiary Hearings for EPA-Issued NPDES Permits and EPA-Terminated RCRA Permits, as part of its appeals process for NPDES permits. See 40 C.F.R. § 124.19.

5. PUBLIC NOTICE

EPA published public notice of a 30-day comment period of a draft NPDES permit for this facility in the *Washington Post* and *Washington Times* on March 28, 2002. EPA extended this public comment period for an additional 60 days and ended it on June 28, 2002. During this 90-day public comment period, EPA received comments from 52 interested parties. In response to these comments, EPA amended the draft permit and fact sheet and offered a revised NPDES permit and fact sheet for public comment on December 18, 2002.

Notice of the December 2002, public comment period was published in the *Washington Post* and *Washington Times*. On January 21, 2003, EPA conducted a public hearing at Sibley Memorial Hospital in Washington, D.C. Three persons offered testimony during the public hearing. During this public comment period, which ended January 30, 2003, EPA received comments from thirteen interested parties and the Commonwealth of Virginia. You may see a summary of the comments received during the public hearing and the public comment period plus EPA's responses thereto in the Response to Comments, which is in the administrative record for this NPDES permit.

On March 13, 2003, EPA received certification of the December 2002, draft permit by the District of Columbia Department of Health (D.C. DOH), as required by Section 401(a)(1) of the Act, and 40 C.F.R. § 124.53. The final permit contains requirements specified by the District of Columbia's certification letter as conditions for certification.

To allow the Corps to meet its obligations under the National Environmental Policy Act (NEPA) and to have adequate time to install the necessary technology to meet the numeric discharge limits in the permit, EPA intends to enter a Federal Facilities Compliance Agreement (FFCA) with the Corps. EPA will offer notice of a 30 day public comment period for the FFCA in the *Washington Post* and *Washington Times* on March 17, 2003.

You may review a copy of the final permit, this fact sheet and the complete administrative record in its entirety at the Martin Luther King, Jr. Library, 901 G Street, NW, Washington, D.C. 20001 during normal business hours.

A copy of the final permit and fact sheet will also be available on the EPA Region III website. The address is the following: http://www.epa.gov/region03

6. ENDANGERED SPECIES ACT (ESA) CONSULTATION AND REISSUANCE OF THIS PERMIT

Under section 7(a)(2) of the Endangered Species Act (ESA) EPA must consult regarding issuance of an NPDES permit that may affect any federally listed endangered or threatened species. In the spring of 2001, EPA and National Oceanic and Atmospheric Administration (NOAA) Fisheries entered into informal Section 7 consultation. EPA worked with the United States Fish and Wildlife Service (FWS) regarding the whole effluent toxicity studies in the scope of work and the performance of studies reported in the *2001 Water Quality Studies in the Vicinity of the Washington Aqueduct (Water Quality Studies).* In November of 2001, FWS informed EPA that no federally proposed or listed endangered or threatened species under their

jurisdiction were known to exist within the boundaries of the proposed federal action area and that no further consultation with FWS was required for this permit.

EPA used the *Water Quality Studies* to develop a Biological Evaluation (BE) to assess the impacts of the discharges on shortnose sturgeon. NOAA Fisheries provided comments to EPA on the contents of the BE and EPA provided a final draft BE to NOAA Fisheries on June 13, 2002. In the BE, EPA concluded that the issuance of the March 2002 draft NPDES permit for the Washington Aqueduct was not likely to adversely affect shortnose sturgeon. This determination was based on EPA's opinion that the scientific studies performed showed that the conditions contained in the March 2002 draft permit were protective of aquatic species present in the action area and the D.C. Water Quality Standards.

It was also EPA' s contention that the issuance of the March 2002 draft permit would be the first step in an overall plan to significantly reduce or eliminate Aqueduct discharges from the Potomac River. The permittee had indicated that the spring is typically the time when discharges occur most frequently due to the high river flows. For the first time, the March 2002 draft permit would have prohibited discharges annually from February 15 to June 15 (subsequently changed to February 15 - June 30 for the purposes of the revised draft permit), to protect anadromous species. Permittee indicated that discharging during the spring spawning season might be necessary, which would require invoking the bypass or upset provision in the permit. Because shortnose sturgeon may be potentially present and spawning near the Aqueduct outfalls during the spring, NOAA Fisheries determined that this action may adversely affect shortnose sturgeon. Therefore, in a letter to NOAA Fisheries, dated June 13, 2002, EPA, requested the initiation of formal consultation on the issuance of an NPDES permit for the Washington Aqueduct discharges. On July 9, 2002, NOAA Fisheries informed the EPA that it agreed to formal consultation and would issue a Biological Opinion (BO) on or before November 5, 2002.

On November 5, 2002, NOAA Fisheries issued BO for the March 2002 draft Washington Aqueduct permit. The BO concluded that the proposed issuance of the March 2002 draft NPDES permit may adversely affect shortnose sturgeon eggs and larvae but was not likely to jeopardize the continued existence of the Chesapeake Bay distinct population segment (DPS) of shortnose sturgeon. NOAA Fisheries also concluded that the proposed permit was not likely to adversely affect juvenile or adult shortnose sturgeon present in the vicinity of the Aqueduct discharge outfalls. No critical habitat has been designated for this species, and therefore, none will be affected.

On December 18, 2002, EPA issued for public comment a revised draft permit. EPA incorporated additional notification requirements and the performance of additional studies, which NOAA Fisheries recommended in the BO, in the revised draft permit. The additional studies were at Part III.D and the additional notification requirements were at Part III.E. To protect against any unknown effects of the discharge, this revised draft permit would have retained the prohibition against discharges during the spring spawning season, and extended the spring spawning season for an additional two weeks to protect fish eggs and larvae that might

spawn in mid-June. EPA removed the emergency provision that the March 2002 draft permit contained.

After reviewing the comments on the revised draft permit, the Region decided that it would be appropriate to reinitiate consultation with NMFS. However, because the Region thought it was important to issue the permit as quickly as possible to protect the fish spawning during the 2003 fish spawning season, the Region decided to issue the permit and complete consultation after the permit was issued. It is the Region's view that it could take this course of action in accordance with Section 7(d) of the ESA. Therefore, EPA intends to reinitiate formal consultation with the NOAA Fisheries by submitting the final permit, FFCA and updated biological evaluation to the National Marine Fisheries Service (NMFS) when the FFCA is final.

7. BRIEF DESCRIPTION OF THIS ACTION

A. Permit

US EPA Region III, which is the NPDES permitting authority for the District of Columbia, has reissued an NPDES permit to the Washington Aqueduct. This permit modifies the following conditions of the permit issued in 1989:

- The final permit combines former permit numbers DC000329 and DC0000019.

- The final permit adds a requirement to monitor for chlorine in the discharge of the Dalecarlia sedimentation basins and treated water blow off through outfalls 002, 006 and 007, and establishes a no discharge limit for chlorine. For the purpose of this permit, EPA defines no discharge as equal to or greater than 0.1 mg/L. This is a measurement that can be achieved in the field (chlorine has no holding time) and is consistent with MDE requirements upstream for WSSC. Since chlorinated water is not used to flush the Georgetown sedimentation basins, EPA has not required monitoring for or limits for chlorine at Georgetown.

- There shall be no direct discharge of the contents of the sedimentation basins through Outfalls 002, 003 or 004, during the spring spawning season, which the permit defines as February 15 through June 15 each year. The basis for this water quality-based effluent conditions is the narrative portion of the District of Columbia Water Quality Standards. In addition, the 1998 Fisheries Panel Report and the 1993 Dynamac Study recommend the prohibition and the *2001 Water Quality Study* supported it. Subsequent studies performed by the Corp's contractor show that the aluminum bearing sediment is neither acutely nor chronically toxic to fish, however, in accordance with the BO issued by NOAA Fisheries, EPA intends the prohibition to protect eggs and larvae during the spring spawning season.

- The final permit contains technology-based effluent limits (30 mg/l average monthly and 60 mg/l maximum daily) for total suspended solids (TSS) on outfalls 002, 003 and 004..

The basis for technology-based limits is Best Conventional Control Technology (BCT) which is applicable to TSS. Available technology should easily meet these limits.

- The final permit contains technology-based effluent limits for aluminum (4 mg/l average monthly and 8 mg/l maximum daily) on outfalls 002, 003 and 004. In addition, EPA performed a reasonable potential analysis for metals and it was determined that aluminum was the only metal that had a potential to exceed water quality standards. EPA calculated a water quality-based limit of 5 mg/l average monthly and 8 mg/l maximum daily. However, since the technology-based limit is more stringent, the technology-based limit applies. Best Available Technology (BAT) is the basis for technology-based limits for aluminum. (EPA has not promulgated guidelines governing drinking water plant discharges. Permitting authorities may apply Best Professional Judgement to establish BCT and BAT. To support its analysis relied in part on a survey of technologies commonly used at drinking water treatment plants in Region III and many states.)

- Using a combination of engineering and/or Best Management Practices, the permit requires the permittee to increase the amount of incoming residual solids removed from the Dalecarlia and Georgetown sedimentation basins by a minimum of 85%. The percent removal means the permittee must remove 85% of the flocculent and process water residual solids that enter the sedimentation basins. This percent removal is consistent with guidelines for identifying limits in effluent limit guidelines and is also consistent with EPA's removal efficiencies for municipal dischargers.

- Permittee must record surface, mid-depth and bottom water temperatures 24 hours before an anticipated discharge during the shortnose sturgeon spawning season.

- The permit updates the administrative penalty provisions.

- The final permit contains a requirement to send Discharge Monitoring Reports (DMRs) to other government agencies, besides EPA, and notification in the event of an anticipated or unanticipated bypass or upset during the spring spawning season.

- The permit requires development and implementation of a Best Management Practices Plan. EPA carried over this requirement from the former permit DC0000329.

- The permit prohibits the permittee from discharging dredged material from the Dalecarlia Reservoir into the Potomac River.

- In consultation with the NMFS, the permit requires the permittee to conduct a study to determine to what extent shortnose sturgeon use the area in the vicinity of Little Falls for spawning.

- To the extent possible, any shortnose sturgeon captured as a result of the Little Falls habitat study will be held alive for examination by NMFS or other designated personnel,

for the collection of tissue samples for nuclear DNA analysis or other scientific examination.

- In consultation with NMFS and EPA the permittee must perform additional acute and chronic toxicity studies. The studies shall include testing on Ceriodaphnia and 1 - 7 day old fathead minnows for the acute tests. Studies shall include the study of sediment toxicity above and below each outfall. If 25% or more of any acute or chronic toxicity test series with any test species on an individual outfall occurs within one year of testing occurs, the Corps will prepare and submit to EPA a plan for conducting a Toxicity Identification Evaluation (TIE) of that discharge. The Corps will then conduct TIE testing for each discharge of that outfall for the following year. As part of EPA's consultation with NMFS, EPA intends to discuss modifying this permit provision to include the following requirement: If the habitat studies show that shortnose sturgeon are in the vicinity of Little Falls, in consultation with NMFS, the permittee will conduct toxicity studies using commercially available shortnose sturgeon.

- In consultation with EPA and NMFS, the permit requires permittee to perform a study to determine the effect of solids (settleable solids, suspended solids and depositional sediment) on fish growth and spawning success. This study will include testing the effects of solids on egg and larval stages of surrogate species. As part of EPA's consultation with NMFS, EPA intends to discuss modifying this permit provision to include the following requirement: If, as a result of the habitat study, shortnose sturgeon are found to be present in the vicinity of Little Falls, the permittee will conduct additional solids studies using commercially available shortnose sturgeon.

- Permittee shall submit a plan to EPA to describe how it will perform a soil sampling study to characterize the75 foot channels on National Park Service Property in which effluents from Outfalls 003 and 004 flow. Upon EPA approval of the plan, permittee shall implement the plan according to the plan schedule.

- In the event it is determined that it is necessary to remove the rocks from the vicinity of Outfall 002 to ensure a controlled and measurable rate of sediment discharge, within six months of that determination, the permittee shall consult with and apply for a permit(s) from the National Park Service.

- Permittee must perform ichthyplankton sampling immediately before, during and after a bypass/upset during the shortnose spawning season.

- Permittee may petition to modify the permit to remove the prohibition to discharge during the spring spawning season if it can show that it is meeting its numerical effluent limitation conditions and that they are sufficiently protective of the spring spawn.

B. Federal Facilities Compliance Agreement (FFCA)

To allow the Corps to meet its obligations under the National Environmental Policy Act (NEPA), EPA intends to enter into an FFCA with the Corps. EPA proposes that this enforcement action would include the following substantive provisions:

- Other than the numeric discharge limitations described in Parts I.A., B, C and D of the permit, the permittee will immediately comply with all provisions of the issued permit (including the prohibitions on discharges during the spring spawning season)

- The permittee would take any and all necessary steps within its power to achieve compliance with the numeric discharge limits set forth in the NPDES permit as soon as practicable, consistent with the permittee's obligations pursuant to NEPA.

- Within a specified period of time after the effective date of the permit, the permittee will complete and submit to EPA an analysis of engineering and/or best management practices to achieve compliance with the numeric discharge limitations set forth in the permit.

- Within a specified period of time after the effective date of the permit, the permittee shall identify in a notice to EPA the engineering/best management practices it will implement to achieve compliance with the numeric discharge limitations set forth in the permit. The notice shall include a schedule for implementation including major milestones.

- No later than December 30, 2009, the permittee shall have fully implemented all engineering/best management practices and shall achieve compliance with the numeric discharge limitations for all basins set forth in the permit.

- Until the permittee has fully implemented all engineering/best management practices and achieved compliance with the numeric discharge limitation set forth in the permit, the permittee will not discharge through Outfall 002 (discharge from Dalecarlia sedimentation basins numbered 1, 2, 3 and 4), unless the flow in the Potomac River is equal to or greater than 800 million gallons per day (MGD) as measured at the gauge station at Little Falls, and through Outfall 003 (discharge from Georgetown sedimentation basin number 1) and Outfall 004 (discharge from Georgetown sedimentation basin number 2), unless the flow in the Potomac River is equal to or greater than 1500 million gallons per day (mgd) as measured at the gauge station at Little Falls.

- Until the permittee has fully implemented all engineering/best management practices and achieved compliance with the numeric discharge limitations set forth in the permit, the permittees will slow the flocculent/sediment discharge rate from Outfalls 003 and 004 to a minimum of 36 hours per basin. In addition, the permittee will increase the amount of untreated process water that it uses to flush and clean each of the Georgetown sedimentation basins to twice the amount used for each cleaning in calendar year 2001.

- During an upset or bypass that occurs during the spring spawning season, the Corps will use best efforts to slow the rate of discharge from outfalls 003 and 004 to 72 hours per basin.

C. Modifications to the issued permit compared to the December 19, 2002 draft permit.

- The Wholesale Customers have been removed from the permit as co-permittees. The Corps of Engineers is the sole permittee for the issued permit.

- Conservation recommendations contained in the November 5, 2002 BO were removed from the final permit. The reasonable and prudent measures and terms and conditions have been retained.

- The final permit is based on a Section 7(d) determination and contains a reopener clause pending initiation of formal consultation under the Endangered Species Act on the final permit and FFCA.

- The no detect limit for chlorine is defined as equal to or greater than 0.1 mg/L. This is a measurement that can be achieved in the field (chlorine has no holding time) and is consistent with MDE requirements upstream for WSSC.

- The sampling point for the chlorine samples for Outfall 002 shall be in an access port in the discharge pipe between the Dalecarlia Basins and the point of entry into the Potomac River. EPA changed the sampling location requirement because the permittee recently advised that the solids discharge pipe has been encased in concrete.

- The sampling point for the underdrain samples (Outfall 002) shall be the access port in the discharge pipe between the point at which the basin underdrains tie into a single pipe and the point of entry into the Potomac River. EPA changed the sampling location requirement because the permittee recently advised that the solids discharge pipe has been encased in concrete.

- The language which prohibits discharge during the spring spawning season was moved from Part I Effluent Limitations and Monitoring Requirements to Part III. Special Conditions.

- The spring spawning season is now defined as from February 15 to June 15 of each year.

- Studies to characterize the remobilized solids has been deleted because in large part this work was already performed during the subsequent modeling studies. In the event that the permittee does not comply with the schedule in the FFCA, EPA will reevaluate the need to impose these or similar studies.

- Studies to determine the amount, location, particle characteristics, fate and historic and aggregation characteristics of the sediment deposition have been removed because some of this work was included in the subsequent modeling studies. In the event that the permittee does not comply with the schedule in the FFCA, EPA will reevaluate the need to impose these or similar studies.

- Studies to clarify whether or not flocculated clays and silts remain flocced and if sands remain de-flocced were removed because these assumptions were modified in the subsequent modeling studies.

- The final permit does not require a study to evaluate the habitat and use of the Potomac River and Chesapeake Bay by shortnose sturgeon. These studies were removed because they would have limited value in light of the permittee's agreement to reduce its discharge in accordance with the FFCA. In the event that the permittee does not comply with the schedule in the FFCA, EPA will reevaluate the need to impose these studies.
  The study to evaluate the use of the Potomac in the vicinity of Little Falls was retained.

- The final permit does not require a study to evaluate the biological and quantitative physical habitat on the Potomac River and a reference stream because these studies would have limited value in light of the permittee's agreement to reduce its discharge in accordance with the FFCA. In the event that the permittee does not comply with the schedule in the FFCA, EPA will reevaluate the need to impose these studies.

- Permittee is required to measure temperature only in the event of an upset or bypass and may use data from the USGS sampling station at Little Falls.

- Permittee is required to perform additional measures as outlined in the District of Columbia's certification letter.

- The Interstate Commission on the Potomac River Basin has been added as to the list of agencies receiving the annual compilation of daily monitoring reports (DMRs), notice of upset or bypass and noncompliance which may endanger health or the environment.

- The requirement to remove 85% of TSS has been move from Part III to Part I.

D. Modifications to the Issued Permit as DC Certification Requirements

- DC DOH will review and approve all work plans prepared in accordance with the studies found at Part III of the permit.

- Permittee shall perform shear stress tests at 10 sites on the Potomac River to determine the erodibility (resuspension) of the discharged solids. Tests should provide a foundation for hydrodynamic modeling of clarity and total suspended solids.

- Permittee shall collect and analyze core samples at each of the sites selected for shear stress analysis. Cores shall be analyzed for nitrogen, phosphorus, TOC and grain size and for a full range of metals, including aluminum.

- Permittee shall measure sediment (nutrient) fluxes at five stations to include SOD, phosphorus and nitrogen. Consideration must be given to the binding of phosphorus to the aluminum sediments under different pH and oxygen conditions.

- Permittee shall perform algal growth assays to determine nutrient availability of the discharged sediments. Alkalinity, carbonate series and pH of the sediments must be determined.

- Permittee shall coordinate all future hydrodynamic or water quality related testing with state, regional and Federal Potomac River modeling efforts.

- Permittee shall maintain a current operations manual which describes operation and maintenance procedures for the facility. This manual shall be kept at the facility and made available for inspection by DC DOH or other authorized Federal or state inspectors during regular business hours.

- In accordance with the provisions of the Water Pollution Control Act, D.C. Code § 8-103.01 et seq., and the implementing regulations in Title 21 of the District of Columbia Municipal Regulations (DCMR) the following additions were also made to the final permit: Part II.B.3.c.2b. DC DOH Fisheries and Wildlife Division and its telephone number were added to be contacted in the event of a bypass; Part II.C.5 the address for the Environmental Health Administration was amended to include Bureau of Environmental Quality; and Part II.D.13 was amended to include notification to DC DOH in the event of a change in discharge of toxic substances.

8. FACILITY DESCRIPTION

The U.S. Army Corps of Engineers owns and operates the Dalecarlia and McMillan Water Treatment Plants, which supplies potable water to approximately one million residents in the District of Columbia, Arlington County, the City of Falls Church, and portions of Fairfax County and Maryland. The Plants provides the water at cost to the Wholesale Customers, e.g., the District of Columbia, Arlington County and the City of Falls Church, Virginia. The customers approve the capital construction budget and are responsible for depositing with the Washington Aqueduct sufficient funds to cover their proportional share of the total costs for running and/or funding improvements to the Aqueduct.

An act of Congress created the Washington Aqueduct Division Water Supply System in the mid-1800's with the construction of the Great Falls Dam and intake, which is located in Maryland and on the Potomac River. Besides the intake at the Great Falls Dam, there is a second intake at Little Falls, which is also located in Maryland. Water flows by gravity from the Great Falls intake to a forebay adjacent to the Dalecarlia Reservoir. From this forebay, a low-lift booster pump station pumps water into the Dalecarlia Reservoir. The Little Falls Pumping Station also delivers water directly to the Dalecarlia Reservoir.

The Dalecarlia Reservoir is a 46-acre earthen basin that serves as a pretreatment reservoir for two water treatment plants. By this it is meant that approximately 51% of the untreated sediments, which are naturally occurring solids in the raw water taken from the Potomac River, are separated from the aqueous portion of the untreated water in the Dalecarlia Reservoir. These untreated sediments are high quality soil that is periodically removed from the reservoir and land applied.

Water from the Dalecarlia Reservoir is delivered by gravity to both the Dalecarlia Water Treatment Plant (Dalecarlia sedimentation basins) and the Georgetown sedimentation basins, also locally known as the Georgetown Reservoir. Water from the Georgetown sedimentation basins is delivered to the McMillan Water Treatment Plant. Regardless of which plant processes the water, treatment is a three-step process that includes sedimentation, filtration and disinfection. The average production is 180 million gallons per day, however, the summertime peak may approach 265 million gallons per day.

Water delivered to the sedimentation basins at Dalecarlia and the Georgetown sedimentation basins contains solids that did not physically settle out at the Dalecarlia Reservoir. To make the water drinkable, these solids must be chemically treated. The Aqueduct does this by adding aluminum sulfate (alum), a widely used drinking water flocculent.

9. PERMITTED OUTFALLS

A. Outfall 002 - Outfall 002 is the primary outfall for process water and the alum treated sediments from Dalecarlia sedimentation basins 1, 2, 3, and 4. In addition, Outfall 002 is the discharge point for leakage from the sedimentation basins and a spring located beneath the Dalecarlia basins which discharges through a pipe into this outfall. The average flow of these leakage discharges is 0.11 million gallons per year.

B. Outfall 003 - Outfall 003 is the principal outfall for the process water and alum treated sediments from Georgetown sedimentation basin 2.

C. Outfall 004 - Outfall 004 is the outfall for process water and alum treated sediments from Georgetown sedimentation basin 1.

D. Outfall 006 - Outfall 006 is the outfall for discharges from the City Tunnel. These discharges consist of treated river water blowoff discharged once per year for the purpose of inspecting the City Tunnel. The average annual flow is one million gallons per year.

E. Outfall 007 - Outfall 007 is the outfall for discharges from the Georgetown Conduit. These discharges consist of treated river water blowoff discharged once per year for the purpose of draining to inspect the Georgetown Conduit. The annual average flow is 0.08 million gallons per year. Rock Creek is the receiving stream for this outfall. All other outfalls discharge to the Potomac River.

10. FINAL EFFLUENT LIMITS

A. For Outfall 002:

- EPA has retained pH requirements from the 1989 permit and based them on the District of Columbia water quality standards.

- EPA has retained monitoring requirements without limitations from the 1989 permit for flow.

- Effluent limits for total suspended solids are based on Best Conventional Technology (BCT) and are 30 mg/l monthly average concentration and 60 mg/l daily maximum concentration.

- Effluent limits for aluminum (4 mg/l average monthly and 8 mg/l maximum daily) on outfalls 002, 003 and 004 are technology based.

- Permittee shall remove 85% of TSS.

- While iron is not used as a flocculent at the Aqueduct, the Corps must monitor for it.

- The final permit requires monitoring of the Dalecarlia effluent for chlorine and prohibits the discharge of chlorine. For this permit, EPA has defined no discharge as equal to or greater than 0.1 mg/L. The sampling point for the chlorine samples shall be in an access port in the discharge pipe between the Dalecarlia Basins and the point of entry into the Potomac River.

- The final permit retains the narrative D.C. Water Quality Standard (WQS) based requirement that there shall be no discharge of floating solids or visible foam in other than trace amounts.

- The final permit contains the water quality-based prohibition against untreated discharge from February 15 and June 15 of each calendar year. EPA based this condition upon D.C. WQS 1104.1 which states that surface waters of the District shall be free from substances in amounts or combinations that do any one of the following: (d) cause injury to, are toxic to, or produce adverse physiological or behavioral changes in humans, plants or animals and (f) impair the biological community that naturally occurs in the waters or depends on the waters for its survival and propagation.

B. For Outfalls 003 and 004

- EPA has retained pH requirements from the1989 permit and based them on the District of Columbia water quality standards.

- Effluent limits for total suspended solids are based on Best Conventional Technology (BCT) and are 30 mg/l monthly average concentration and 60 mg/l daily maximum concentration.

- Effluent limits for aluminum (4 mg/l average monthly and 8 mg/l maximum daily) on outfalls 002, 003 and 004 are technology based;

- Permittee shall remove 85% of TSS;

- The Permittee uses raw water at Georgetown to flush the basins during cleaning. This raw water does not contain chlorine, therefore, the permit does not require chlorine monitoring for these outfalls.

- The permit retains the narrative D.C. WQS based requirement that there shall be no discharge of floating solids or visible foam in other than trace amounts.

- The final permit contains the water quality-based prohibition against untreated discharge from February 15 and June 15 of each calendar year. EPA based this condition upon D.C. WQS 1104.1 which states that surface waters of the District shall be free from substances in amounts or combinations that do any one of the following: (d) cause injury to, are toxic to, or produce adverse physiological or behavioral changes in humans, plants or animals and (f) impair the biological community that naturally occurs in the waters or depends on the waters for its survival and propagation.

C. For Outfall 002. Discharge of effluent consisting of leakage from basin joints and/or discharge from a spring beneath the Dalecarlia sedimentations joined through a pipe to outfall 002.

This discharge was first regulated in accordance with the terms of NPDES permit DC0000329, now incorporated into permit DC0000019. The final permit retains the conditions of permit DC0000329, which are based on a Best Professional Judgement determination of the treatment requirements of the best available technology economically achievable (BAT) and the best conventional pollutant control technology (BCT). The final permit further imposes a water quality-based limit for chlorine that states that this discharge may not contain chlorine in a detectable amount. For the purposes of this permit chlorine is defined as equal to or greater than 0.1 mg/l.

Based upon new information presented by the Corps by letter dated March 3, 2003, the sampling point for the underdrain samples (Outfall 002) shall be the access port in the discharge pipe between the point at which the basin underdrains tie into a single pipe and the point of entry into the Potomac River. EPA changed the sampling location requirement because the solids discharge pipe has been encased in concrete.

D. For Outfalls 006 and 007.

EPA carried over the permit requirements for outfalls 006 and 007, which include flow, total suspended solids, total aluminum, iron and total residual chlorine, from NPDES permit DC0000329. The permit also has a new requirement that the Permittee may not discharge

chlorine in a detectable amount. EPA based these requirements on BAT and BCT. Implementation and achievement of these limits will meet water criteria for these parameters and protect the designated uses of the Potomac (for outfall 006) and Rock Creek (for outfall 007). EPA based the limit for chlorine on the D.C. The final permit further imposes a water quality-based limit for chlorine that states that this discharge may not contain chlorine in a detectable amount. For the purposes of this permit the permit defines a detectable amount as equal to or greater than 0.1 mg/l..

11. SUMMARY OF TECHNOLOGY-BASED LIMITS

TSS concentrations of 30/60 mg/l have been identified as consistent with best practical control technology for water treatment plants (WTP) discharges, with 30 mg/l "typically" required (ASCE et al, 1996). A review of permits for more than 400 other in Region III showed that other WTP facilities have achieved a TSS limit of 30 mg/l (Colley 1995). In addition, other states such as Michigan use 30 mg/l monthly average as a treatment-based BPJ limit for WTP backwash discharges.

At least until the Corps installs a new technology at the Aqueduct, discharges will occur on an intermittent basis as each basin is cleaned. Each basin discharges between two and five times per year. Effluent samples collected during discharges from Outfall 003 in May of 2002 (EA 2001) showed that TSS concentrations at outfall 003 ranged from 4,700 mg/l to 12,3000 mg/l and aluminum concentrations ranged from 26 mg/l to 1,300 mg/l.

During the May of 2002 sampling, TSS concentrations at Outfall 002, ranged from 4,600 mg/l to 16,500 mg/l and aluminum ranged from 1,020 mg/l to 1,810 mg/l. During an EPA sampling of October 21, 2002, TSS levels at Outfall 002 were reported at 4,300 mg/l and aluminum at 983 mg/l. Assuming that the total solids mass and liquid volume reported in the 2001 permit application are released daily rather than only four or five times per year, then the concentration of the releases would average approximately 5,000 mg/l, which is above the 30/60 mg/l permit limit.

Residual handling technologies span a broad range of complexity, ranging from redirecting the residuals to an off-site handling facility to implementing a multiple step, on-site dewatering and disposal process. The process of residuals handling has three parts: (1) the initial handling process that includes on or all of the following - thickening, dewatering and drying; (2) the final disposal of the solids; and (3) the final disposal of the separated liquid, or supernatant.

The ultimate disposal of the solids, and the solids content requirements of that disposal option, drive the selection of the thickening, dewatering and drying processes implemented. The quantity of solids produced and the costs of disposal per unit volume, is also an important part of the decision making process.

Following the FFCA, the Corps will complete an alternatives evaluation and disposal study. The purpose of this study is to identify a range of engineering and /or best management practices capable of achieving the technology-based permit limits.

12. SUMMARY OF WATER QUALITY-BASED LIMITS

Following the release of the *2001 Water Quality Studies in the Vicinity of the Washington Aqueduct,* the consultant for the permittee did additional modeling scenarios for discharge events. EPA used these scenarios for the March 2002 draft permit to show that discharge events over a range of Potomac River flows (3500 mgd, 2500 mgd, 1500 mgd and 800 mgd) would meet District of Columbia water quality standards. In addition, EPA used these model runs to provide dilution factors at the edge of the mixing zone and to examine the depositional footprint resulting from the sediment releases. In November of 2002 the consultant conducted additional modeling studies in conjunction with Region III and EPA's Office of Research and Development Laboratory at Athens Georgia. The object of this additional work was to answer some questions that resulted from the previous studies, and to demonstrate the sensitivity of the predicted sediment transport and depositional scenarios to assigned sediment characteristics including particle size, shear stress for deposition and settling velocity.

The additional scenarios were conducted at Potomac River flows of 800 mgd and 1500 mgd for a discharge event at the Dalecarlia Basin (Outfall 002) and at a 1500 mgd discharge event from the Georgetown Reservoir (Outfall 003). Up to four model runs were used for each river flow.

The results of this work demonstrated the following:

1. By evaluating conservation of mass from the upper to the lower boundaries of the model domain, the numerical stability of the models was demonstrated;

2. After incorporating EPA's recommendations the particle deposition patterns and depths were still very small, and not substantively different than the original modeling results;

3. The use of the alternative particle size classification suggested by EPA reduced the amount of sediment deposition within the model domain relative to the original modeling; and

4. By conducting additional depositional modeling of the background TSS in the Potomac River and comparing it to the deposition from the Aqueduct releases, one can see that the downstream sediment deposition from the Aqueduct is much smaller than the natural deposition that takes place for TSS entering from upstream.

These results are useful to demonstrate that, in the event of a bypass or upset event, release of solids at lower Potomac River flows will not exceed District of Columbia water quality standards.

On October 21, 2002, the Corps discharged solids from Dalecarlia sedimentation basin number 2. EPA sampled the supernatant and solids from that basin as well as aqueous samples from the Dalecarlia Reservoir. The samples were analyzed at EPA's laboratory at Fort Meade for the following parameters: volatile organics, pesticides/PCBs, herbicides, BOD, TSS, chloride, nitrite, sulfate, fecal coliform, dissolved and total metals, and total residual chlorine.

EPA did a reasonable potential analysis using the results of the October 21 sampling. The reasonable potential analysis showed that the effluent and stream samples for dissolved arsenic, dissolved nickel, dissolved copper and dissolved zinc were below quantitation limits. EPA, therefore, assumed that the concentration for these parameters is zero and no reasonable potential analysis was necessary for these metals.

A reasonable potential analysis performed on total aluminum results analyzed from the October 21, 2002 sampling found that total aluminum had the potential to exceed water quality standards. Therefore, EPA calculated water quality based effluent limits for total aluminum. EPA calculated limits of 5.5 mg/l average monthly and 8 mg/l maximum daily averages. Since the District of Columbia does not have a water quality standard for total aluminum, EPA used the technology-based limits of 4 mg/l monthly average and 8 mg/l daily maximum aluminum for the draft permit. In this case, the technology-based limits are more restrictive than the calculated water quality-based limits and the stricter limits apply.

13. STANDARD CONDITIONS

Standard conditions are requirements that must be incorporated into every permit, in accordance with 40 C.F.R. Sections 122.41 and 122.42. These requirements delineate the legal, administrative and procedural requirements of the permit. It includes the standard provisions governing discharges that may be bypasses or upsets.

EPA has updated the portion of the permit that specifies penalties for violations of permit conditions to reflect higher penalties due to changes in the CWA penalty provisions.

The final permit requires the permittee to submit Discharge Monitoring Reports to the National Marine Fisheries Service, National Park Service and ICPRB in addition to EPA and D.C. DOH.

The final permit requires the permittee to provide notice of upset and bypass occurrences to EPA Region III, DC DOH, US FWS, NPS, ICPRB and NMFS.

The final permit requires the permittee to provide notice of noncompliance which may endanger human health or the environment to EPA, DC DOH, USNPS, USFWS, ICPRB and NMFS

The final permit provides that the permittee may petition EPA to modify the permit if the results of studies show that the numerical effluent limits are sufficiently protective and that the prohibition to discharge during the spring spawning season is not necessary.

The Agency has modified the reopener provision at Part II.A.12 to acknowledge that EPA has done an ESA Section 7(d) determination and will submit the final permit and FFCA to NOAA Fisheries to initiate formal consultation on those documents.

14. SPECIAL CONDITIONS

Part III of the revised draft permit contains the following Special Conditions:

- The permit prohibits discharging untreated sediments from the basins during the spring spawning season. In case of an anticipated or unanticipated bypass or upset during this spring season, the permittee must notify the following of the discharge: EPA, D.C. DOH, NOAA Fisheries, USFWS and NPS.

- The permittee must test the discharge from the Dalecarlia basins for chlorine. If the samples show a detectable amount of chlorine, the permittee shall provide treatment to ensure that the discharge contains no measurable level of chlorine.

- During the shortnose sturgeon spawning season the permittee must record surface, mid-depth and bottom water temperatures in advance and within 24 hours after the bypass or upset event.

- Permittee may not discharge dredged material from the Dalecarlia Reservoir to the Potomac River.

- In consultation with the NMFS, permittee is to conduct a study to determine to what extent shortnose sturgeon use the area in the vicinity of Little Falls for spawning. This study is to be conducted over three years and shall include, but is not limited to, the following: habitat mapping; identifying and sampling overwintering aggregations; tracking adult sturgeon from the overwintering grounds to the spawning sites; ichthyplankton sampling for eggs and larvae and other appropriate measures approved by NMFS.

- To the extent possible, any shortnose sturgeon captured as a result of the habitat study will be held alive for examination by NMFS or any other designated personnel, for the collection of tissue samples for nuclear DNA analysis or other scientific examination.

- In consultation with NMFS, the permittee shall submit to EPA and NMFS for review a study plan to evaluate discharges for acute and chronic toxicity. Studies shall include testing on Ceriodaphnia and 1 - 7 day old fathead minnows for the acute tests. Studies shall include the study of sediment toxicity above and below each outfall. If unacceptable toxicity is measured in 25% or more of the tests for any species at an individual outfall, a plan for conducting a Toxicity Identification Evaluation (TIE) of that discharge will be prepared and submitted to EPA and NMFS for approval. If the habitat studies described above demonstrate the presence of shortnose sturgeon, EPA and NMFS will require the submission of a study plan to evaluate the discharges for acute and chronic toxicity using commercially available shortnose sturgeon as the test species.

- The permittee shall perform a study to determine the effect of the solids, including settleable solids, suspended solids and depositional sediment, on fish growth and spawning success. The study shall include testing on the effects of solids on egg and larval stages of surrogate species. If the habitat studies described above demonstrate the

presence of shortnose sturgeon, EPA and NMFS will require the submission of a study plan to evaluate the discharges for acute and chronic toxicity using commercially available shortnose sturgeon as the test species.

- The permittee shall submit a plan to EPA to describe how it will perform a soli sampling study to characterize the 75 foot channels on National Park Service property. Upon approval of the plan, permittee shall implement the plan according to the plan schedule.

- Within six months of the issuance date of this permit, the permittee(s) shall consult with and apply for permits from the National Park Service for a project to remove rocks from the vicinity of outfall 002 to ensure a controlled and measurable rate of sediment discharge.

D. Modifications to the Issued Permit as DC Certification Requirements

- Permittee shall perform shear stress tests at 10 sites on the Potomac River to determine the resuspension of the discharged solids.

- Permittee shall take cores at each site (locations of shear stress) and analyses shall be performed for complete suite of metals, nitrogen, phosphorus, TOC and grain size.

- Permittee shall measure sediment fluxes at five stations to include SOD, phosphorus and nitrogen.

- Permittee shall perform algal growth assays to determine nutrient availability of the discharged sediments.

- Permittee shall coordinate all future water quality related testing with DC DOH.

15. Public Notice Publication Date, *Washington Post* and *Washington Times*: March 28, 2002, April 28, 2002, and December 18, 2002

16. Public hearing date: January 21, 2003

17. District of Columbia Certification Letter date: March 13, 2003